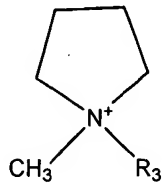
WHAT IS CLAIMED IS:

1. An electrolyte solution having a Tg of less than about –40°C, comprising at least one bifunctional redox dye dissolved in ionic liquid solvent.

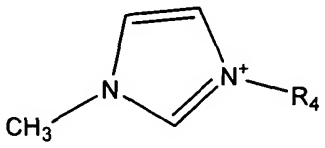
2. The electrolyte solution of claim 1, wherein said bifunctional redox dye comprises at least one redox active anodic moiety and at least one redox active cathodic moiety.

3. The electrolyte solution of claim 1, wherein said bifunctional redox dye comprises at least one energy receptor moiety and at least one redox active anodic moiety, at least one energy receptor moiety and at least one redox active cathodic moiety, or at least one energy receptor moiety and at least one redox active anodic moiety and at least one redox active cathodic moiety.

4. The electrolyte solution of claim 1, wherein said ionic liquid solvent comprises at least one cation selected from the group consisting of lithium cation and quaternary ammonium cations, wherein said quaternary ammonium cations are selected from the group consisting of pyridinium, pyridazinium, pyrimidinium, pyrazinium, imidazolium, pyrazolium, thiazolium, oxazolium, triazolium, tetraalkylammonium, N-methyl morpholinium, cations of the formula $[(CH_3CH_2)_3N(R_1)]^+$, wherein R_1 is alkyl having 2-10 carbons, cations of the formula $[(CH_3)_2(CH_3CHCH_3)N(R_2)]^+$, wherein R_2 is alkyl having 2-10 carbons, cations having the structural formula



wherein R_3 is alkyl having 2-10 carbons, and cations having the structural formula

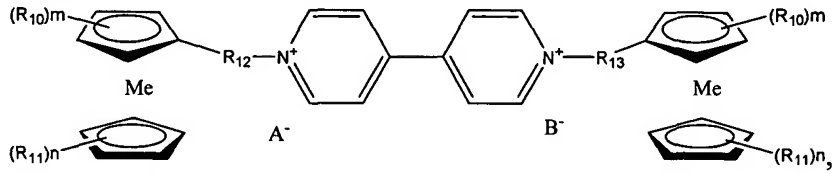


wherein R_4 is alkyl having 2-10 carbons.

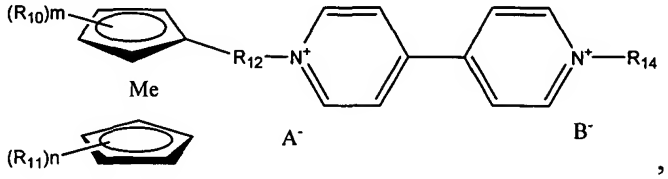
5. The electrolyte solution of claim 1, wherein said ionic liquid comprises at least one anion selected from the group consisting of trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$).

6. The electrolyte solution of claim 2, wherein said anodic moiety of said bifunctional redox dye comprises a pyrazoline, metallocene, phenylenediamine, benzidine, phenoxadine, phenothiazine, tetrafulvalene or phenazine, and said cathodic moiety of said bifunctional redox dye comprises a viologen or anthraquinone.

7. The electrolyte solution of claim 1, wherein said bifunctional redox dye is a compound having the structural formula



or having the structural formula



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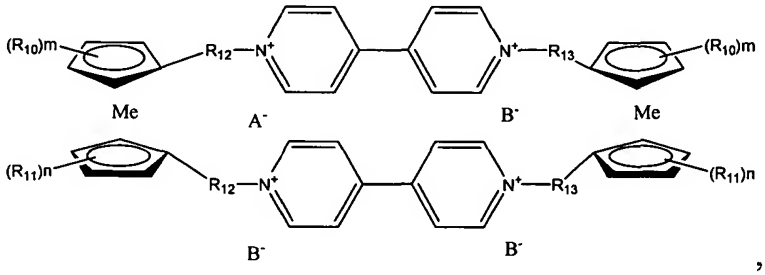
or having the structural formula



,

or having the structural formula

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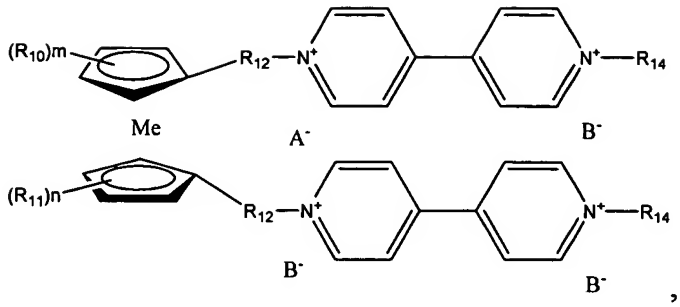

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wherein A^- is selected from the group consisting of trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$); B^- is selected from the group consisting of a halogen anion, ClO_4^-, BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, CH_3COO^-, and $CH_3(C_6H_4)SO_3^-$, trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$); wherein R_{10} and R_{11} are each independently a hydrocarbon group selected from the group consisting of an alkyl, alkenyl and aryl group having 1 to 10 carbon atoms, in the case where R_{10} or R_{11} is an aryl group, the aryl group forms a condensed ring together with a cyclopentadienyl ring; wherein m=0-4; wherein n=0-4; wherein R_{12} and R_{13} are each independently a hydrocarbon residue having 1 to 20 carbon atoms, or alkylene groups having ester-bond unit, ether-bond unit, amide-bond unit, thioether-bond unit, amine-bond unit, urethane-bond unit, or silyl unit in the part of hydrocarbon groups, and R_{14} is a hydrocarbon group selected from the group consisting of an alkyl, cycloalkyl, alkenyl, aryl, or aralkyl group having 1 to 20 carbon atoms, a heterocyclic group having 4 to 20 carbon atoms, and a substituted hydrocarbon or heterocyclic group obtained by substituting part of hydrogens of the hydrocarbon group or heterocyclic group with a substituent group; and Me represents Cr, Co, Fe, Mn, Ni, Os, Ru, V, Mo(X)(Q), Nb(X)(Q), Ti(X)(Q), V(X)(Q)or Zr(X)(Q) wherein X and Q are each independently selected from the group consisting of hydrogen, halogen, an alkyl group having 1 to 12 carbon atoms, ClO_4^-, BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, CH_3COO^-, $CH_3(C_6H_4)SO_3^-$, trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$);

or having the formula

$$Cat_1\text{-}An_1,$$

or having the formula

$$Cat_1\text{-}Bridge_1\text{-}An_1,$$

or having the formula

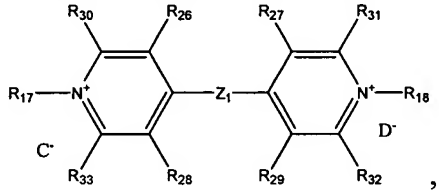
$$Cat_1\text{-}Bridge_1\text{-}An_1\text{-}Bridge_2\text{-}Cat_2,$$

or having the formula

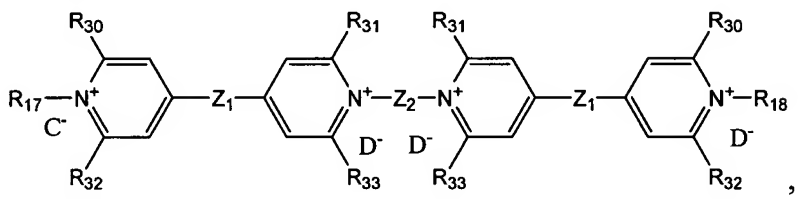
$$An_2\text{-}Bridge_2\text{-}Cat_1\text{-}Bridge_1\text{-}An_1,$$

wherein Cat_1-An_1 represents a charge transfer complex;

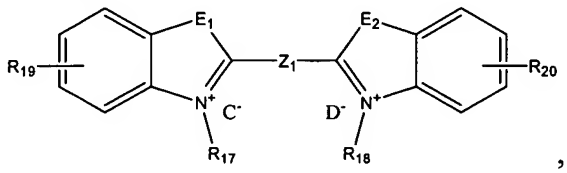
wherein Cat_1 and Cat_2 independently represent a radical having the structural formula



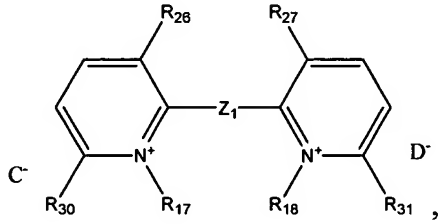
or having the structural formula



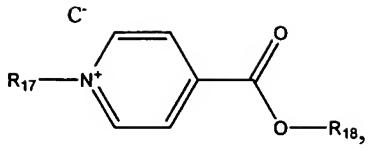
or having the structural formula



or having the structural formula



or having the structural formula



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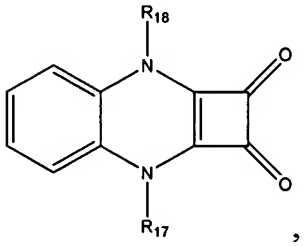

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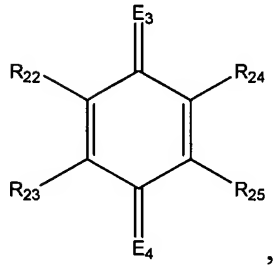

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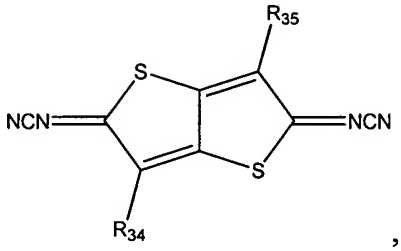
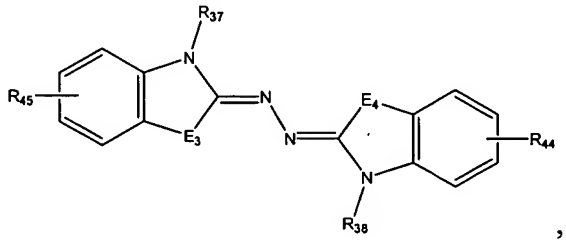


wherein R_{17} and R_{18} independently of one another denote C_1 to C_{18} -alkyl, C_2 to C_{12} -alkenyl, C_3 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} -aryl or R_{17} and R_{18} together form a -$(CH_2)_2$-, -$(CH_2)_3$-, or –CH=CH- bridge, R_{19}, R_{20} and R_{22} to R_{25} independently of one another denote hydrogen, C_1 to C_{18} -alkyl, C_1 to C_4 -alkoxy, halogen, cyano, nitro or C_1 to C_{18} -alkoxycarbonyl or R_{22} and R_{23} and/or R_{24} and R_{25} form a –CH=CH-CH=CH- bridge; R_{26}, R_{27}, R_{28} and R_{29} independently of one another denote hydrogen or, in pairs, a -$(CH_2)_2$-, -$(CH_2)_3$- or –CH=CH- bridge, E_3 and E_4 independently of one another denote O, N-CN, $C(CN)_2$ or N-C_6 - to C_{10}-aryl, R_{34} and R_{35} independently denote hydrogen, C_1 to C_{18} -alkyl, C_1 to C_{18} -alkoxy, halogen, cyano, nitro, C_1 to C_{18} -alkoxycarbonyl or C_6 to C_{10} -

aryl, R_{30} to R_{33} independently of one another denote hydrogen or C_1 to C_6 -alkyl, or R_{30} and R_{26} and/or R_{31} and R_{27} form a –CH=CH-CH=CH- bridge, E_1 and E_2 independently of one another denote O, S, NR_{36} or $C(R_{36})_2$ or E_1 and E_2 together form a -N-$(CH_2)_2$-N- bridge, R_{36} denotes C_1 to C_{18} -alkyl, C_2 to C_{12} -alkenyl, C_4 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} -aryl, Z_1 denotes a direct bond, -CH=CH-, -$C(CH_3)$=CH-, -C(CN)=CH-, -CCl=CCl-, -C(OH)=CH-, -CCl=CH-, -C≡C-, -CH=N-N=CH-, -$C(CH_3)$=N-N=$C(CH_3)$- or –CCl=N-N=CCl-, Z_2 denotes -$(CH_2)_r$- or –CH_2-C_6H_4-CH_2-, r=1-10, C^- is selected from the group consisting of bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$), and D^- is selected from the group consisting of halogen anion, ClO_4^-, BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, CH_3COO^-, and $CH_3(C_6H_4)SO_3^-$, trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$), wherein bonding to the bridge member $bridge_1$ or $bridge_2$ is effected via one of the radicals R_{17}-R_{36}, and the radicals mentioned then represent a direct bond,

and wherein An_1 and An_2 independently represent radicals having the structural formula:



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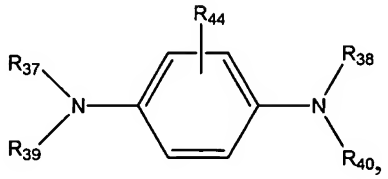
or having the structural formula



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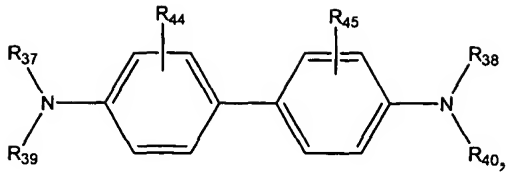
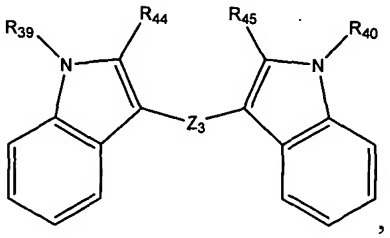


or having the structural formula



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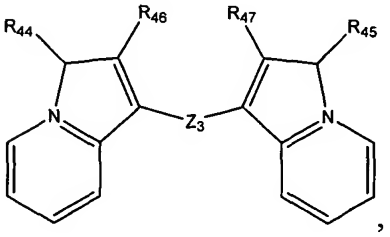

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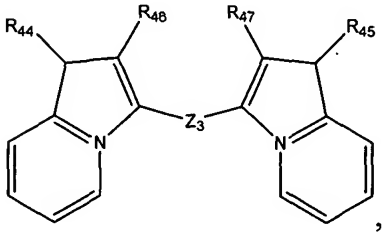

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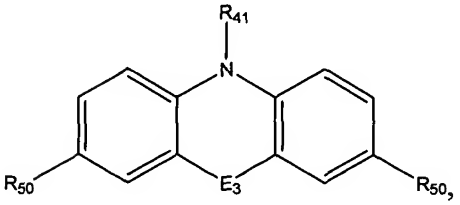

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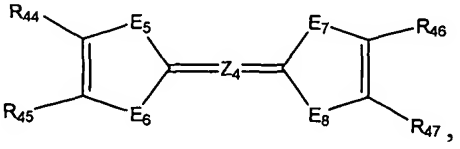

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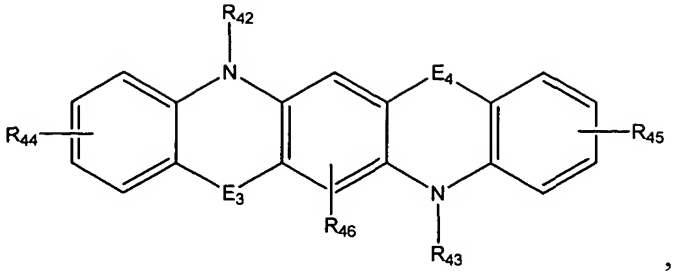

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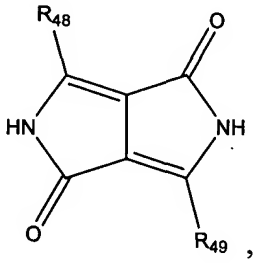

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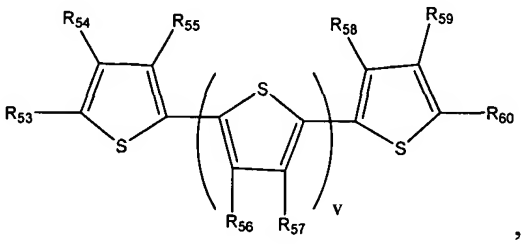

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or wherein An_1 or An_2 independently represent a metal salt comprising titanium (III), vanadium (III), vanadium (IV), iron (II), cobalt (II), copper (I), silver (I), indium (I), tin (II), antimony (III), bismuth (III), cerium (III), samarium (II), dysprosium (II), ytterbium (II), or europium (II), wherein R_{37} to R_{43} independently of one another denote C_1 to C_{18} -alkyl, C_2 to C_{12} -alkenyl, C_3 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} -aryl, and R_{41} to R_{43} additionally denote hydrogen, R_{44} to R_{50} independently of one another denote hydrogen, C_1 to C_{18} -alkyl, C_1 to C_{18} -alkoxy, halogen, cyano, nitro, C_1 to C_{18} -alkoxycarbonyl or C_6 to C_{10} -aryl and R_{48} and R_{49} additionally denote an optionally benzo-fused aromatic or quasiaromatic five- or six-membered heterocyclic ring and R_{50} additionally independently denotes $N(R_{51})(R_{52})$, R_{44} and R_{45} and/or R_{46} and R_{47} form a -$(CH_2)_3$-, -$(CH_2)_4$-, -$(CH_2)_5$- or –CH=CH-CH=CH- bridge, Z_3 denotes a direct bond or a –CH=CH- or –N=N- bridge, $=Z_4=$ denotes a direct double bond or a =CH-CH= or =N-N=

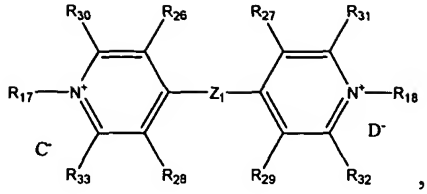
bridge, E_3 and E_4 independently of one another denote O, S, NR_{51}, $C(R_{51})(R_{52})$, C=O or SO_2, E_5 to E_8 independently of one another denote S, Se or NR_{51}, R_{51} and R_{52} independently of one another denote C_1 to C_{12} -alkyl, C_2 to C_8 -alkenyl, C_3 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} –aryl, R_{53} to R_{60} independently of one another denote hydrogen, C_1 - to C_6 -alkyl, C_1 to C_{18} -alkoxy, cyano, C_1 to C_{18} -alkoxycarbonyl or C_6 to C_{10} -aryl, or R_{53} and R_{54} and R_{59} and R_{60} independently of one another together form a $-(CH_2)_3-$, $-(CH_2)_4-$ or –CH=CH-CH=CH- bridge, v=0-10, wherein bonding to the bridge member $Bridge_1$ or $Bridge_2$ is effected by one of the radicals R_{37} –R_{54}, or R_{60} and the radicals mentioned then represent a direct bond, and $Bridge_1$ or $Bridge_2$ independently represents a bridge member of the formula $-(CH_2)_n-$ or $-(Y_1)_s(CH_2)_m-(Y_2)_o-(CH_2)_p-(Y_3)_q-$, each of which is optionally substituted by C_1 to C_{18} -alkoxy, halogen or phenyl, Y_1 to Y_3 independently of one another independently represent O, S, NR_{61}, COO, CONH, NHCONH, cyclopentanediyl, cyclohexanediyl, phenylene or naphthylene, beta-dicarbonyls, R_{61} denotes C_1 to C_6 -alkyl, C_2 to C_6 -alkenyl, C_4 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 - to C_{10} -aryl, n=0-12, m=0-8, p=0-12, o=0-6, q=0-1, and s=0-1.

8. The electrolyte solution of claim 3, wherein said bifunctional redox dye comprises a redox active moiety comprising a pyrazoline, metallocene, phenylenediamine, benzidine, phenoxadine, phenothiazine, tetrafulvalene, phenazine, viologen or anthraquinone, and an energy receptor moiety comprising a benzophenone, benzotraizole, or cyanoacrylate.

9. The electrolyte solution of claim 1, wherein said bifunctional redox dye comprises a compound having the formula

$$[Cat_1][M]$$

wherein M represents a metal salt comprising titanium (III), vanadium (III), vanadium (IV), iron (II), cobalt (II), copper (I), silver (I), indium (I), tin (II), antimony (III), bismuth (III), cerium (III), samarium (II), dysprosium (II), ytterbium (II), or europium (II); wherein Cat_1 represents a ligand having the structural formula



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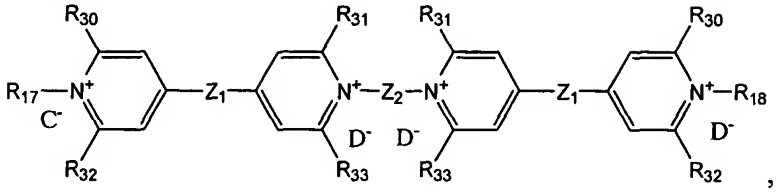

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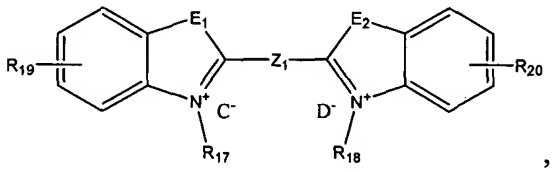

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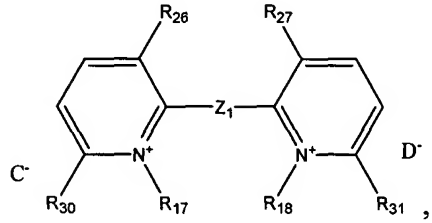

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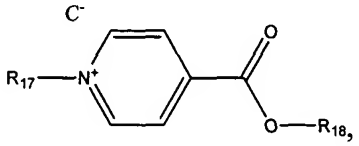

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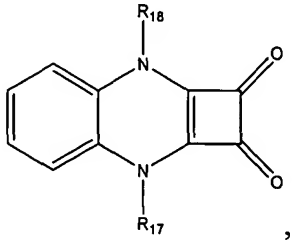

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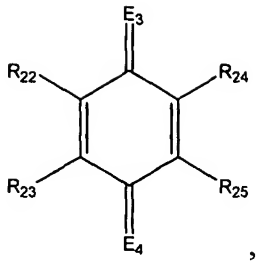

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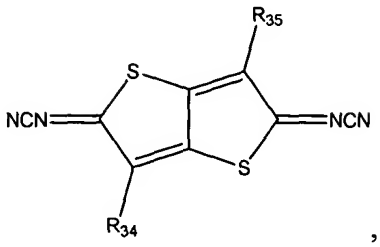

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wherein R_{17} and R_{18} independently of one another denote C_1 to C_{18} -alkyl, C_2 to C_{12} -alkenyl, C_3 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} -aryl or R_{17} and R_{18} together form a $-(CH_2)_2-$, $-(CH_2)_3-$, or –CH=CH-, R_{19}, R_{20} and R_{22} to R_{25} independently of one another denote hydrogen, C_1 to C_{18} -alkyl, C_1 to C_{18} -alkoxy, halogen, cyano, nitro or C_1 to C_{18} -alkoxycarbonyl or R_{22} and R_{23} and/or R_{24} and R_{25} form a –CH=CH-CH=CH- bridge; R_{26}, R_{27}, R_{28} and R_{29} independently of one another denote hydrogen or, in pairs, a $-(CH_2)_2-$, $-(CH_2)_3-$ or –CH=CH- bridge, E_3 and E_4 independently of one another denote O, N-CN, $C(CN)_2$ or N-C_6 - to C_{10}-aryl, R_{34} and R_{35} independently denote hydrogen, C_1 to C_{18} -alkyl, C_1 to C_{18} -alkoxy, halogen, cyano, nitro, C_1 to C_{18} -alkoxycarbonyl or C_6 to C_{10} -aryl, R_{30} to R_{33} independently of one another denote hydrogen or C_1 –C_6 -alkyl, or R_{30} and R_{26} and/or R_{31} and R_{27} form a –CH=CH-CH=CH- bridge, E_1 and E_2 independently of one another denote O, S, NR_{36} or $C(R_{36})_2$ or E_1 and E_2 together form a $-N-(CH_2)_2-N-$ bridge, R_{36} denotes C_1 to C_{18} -alkyl, C_2 to C_{12} -alkenyl, C_4 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} -aryl, Z_1 denotes a direct bond, -CH=CH-, $-C(CH_3)=CH-$, -C(CN)=CH-, -CCl=CCl-, -C(OH)=CH-, -CCl=CH-, -C≡C-, -CH=N-N=CH-, $-C(CH_3)=N-N=C(CH_3)-$ or –CCl=N-N=CCl-, Z_2 denotes $-(CH_2)_r-$ or $-CH_2-C_6H_4-CH_2-$, r=1-10, C^- is selected from the group consisting of bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$), and D^- is selected from the group

consisting of halogen anion, ClO_4^-, BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, CH_3COO^-, and $CH_3(C_6H_4)SO_3^-$, trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide $((CF_3SO_2)_2N^-)$, bis(perfluoroethylsulfonyl)imide $((CF_3CF_2SO_2)_2N^-)$ and tris(trifluoromethylsulfonyl)methide $((CF_3SO_2)_3C^-)$.

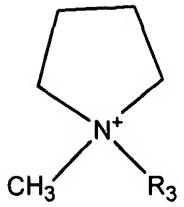
10. The electrolyte solution claim 1, further comprising at least one additive selected from the group consisting of non-ionic cosolvents, polymers, thixotropic agents, and UV stabilizers.

11. An electro-optic device comprising at least one chamber and, as the electrolyte medium inside the chamber, an electrolyte solution having a Tg of less than about –40°C and comprising at least one bifunctional redox dye dissolved in an ionic liquid solvent.

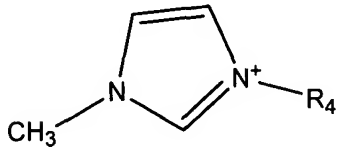
12. The electro-optic device of claim 11, wherein said bifunctional redox dye comprises at least one redox active anodic moiety and at least one redox active cathodic moiety.

13. The electro-optic device of claim 11, wherein said bifunctional redox dye comprises at least one energy receptor moiety and at least one redox active anodic moiety, at least one energy receptor moiety and at least one redox active cathodic moiety, or at least one energy receptor moiety and at least one redox active anodic moiety and at least one redox active cathodic moiety.

14. The electro-optic device of claim 11, wherein said ionic liquid comprises at least one cation selected from the group consisting of lithium cation and quaternary ammonium cations, wherein said quaternary ammonium cations are selected from the group consisting of pyridinium, pyridazinium, pyrimidinium, pyrazinium, imidazolium, pyrazolium, thiazolium, oxazolium, triazolium, tetraalkylammonium, N-methyl morpholinium, cations of the formula $[(CH_3CH_2)_3N(R_1)]^+$, wherein R_1 is alkyl having 2-10 carbons, cations of the formula $[(CH_3)_2(CH_3CHCH_3)N(R_2)]^+$, wherein R_2 is alkyl having 2-10 carbons, cations having the structural formula



wherein R_3 is alkyl having 2-10 carbons, and cations having the structural formula

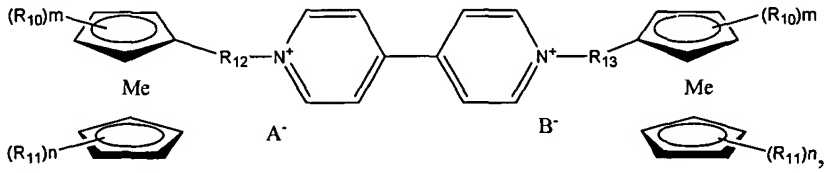


wherein R_4 is alkyl having 2-10 carbons.

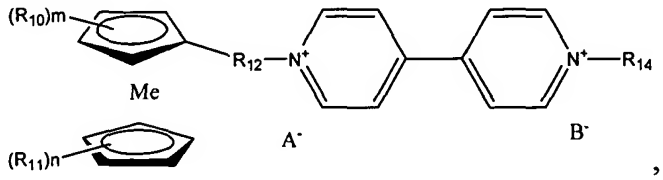
15. The electro-optic device of claim 11, wherein said ionic liquid comprises at least one anion selected from the group consisting of trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$).

16. The electro-optic device of claim 12, wherein said anodic moiety of said bifunctional redox dye comprises a pyrazoline, metallocene, phenylenediamine, benzidine, phenoxadine, phenothiazine, tetrafulvalene or phenazine, and said cathodic moiety of said bifunctional redox dye comprises a viologen or anthraquinone.

17. The electro-optic device of claim 11, wherein said bifunctional redox dye is a compound having the structural formula



or having the structural formula



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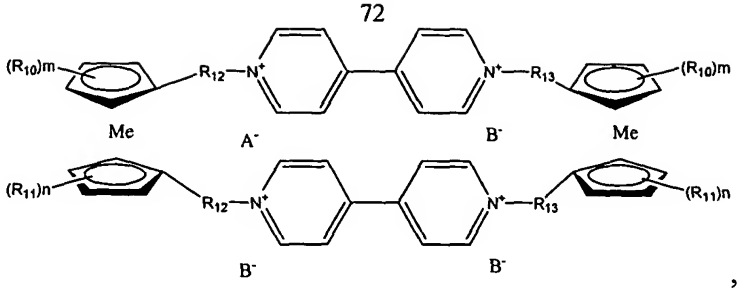
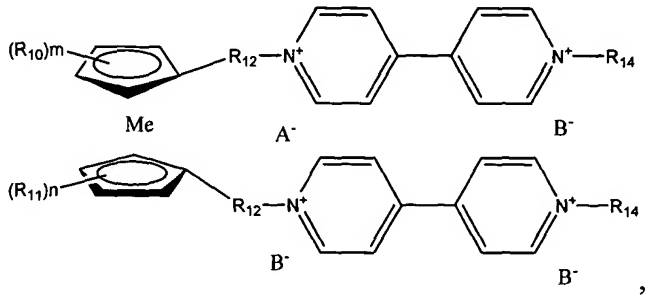
or having the structural formula



or having the structural formula



wherein A^- is selected from the group consisting of trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$); B^- is selected from the group consisting of a halogen anion, ClO_4^-, BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, CH_3COO^-, and $CH_3(C_6H_4)SO_3^-$, trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$); wherein R_{10} and R_{11} are each independently a hydrocarbon group selected from the group consisting of an alkyl, alkenyl and aryl group having 1 to 10 carbon atoms, in the case where R_{10} or R_{11} is an aryl group, the aryl group forms a condensed ring together with a cyclopentadienyl ring; wherein m=0-4; wherein n=0-4; wherein R_{12} and R_{13} are each independently a hydrocarbon residue having 1 to 20 carbon atoms, or alkylene groups having ester-bond unit, ether-bond unit, amide-bond unit, thioether-bond unit, amine-bond unit, urethane-bond unit, or silyl unit in the part of hydrocarbon groups, and R_{14} is a hydrocarbon group selected from the group consisting of an alkyl, cycloalkyl, alkenyl, aryl, or aralkyl group having 1 to 20 carbon atoms, a heterocyclic group having 4 to 20 carbon atoms, and a substituted hydrocarbon or heterocyclic group obtained by substituting part of hydrogens of the hydrocarbon group or heterocyclic group with a substituent group; and Me represents Cr, Co, Fe, Mn, Ni, Os, Ru,

V, Mo(X)(Q), Nb(X)(Q), Ti(X)(Q), V(X)(Q)or Zr(X)(Q) wherein X and Q are each independently selected from the group consisting of hydrogen, halogen, an alkyl group having 1 to 12 carbon atoms, ClO_4^-, BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, CH_3COO^-, $CH_3(C_6H_4)SO_3^-$, trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$);

or having the formula

$$Cat_1\text{-}An_1,$$

or having the formula

$$Cat_1\text{-}Bridge_1\text{-}An_1,$$

or having the formula

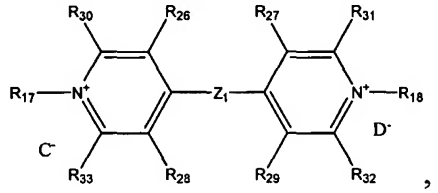
$$Cat_1\text{-}Bridge_1\text{-}An_1\text{-}Bridge_2\text{-}Cat_2,$$

or having the formula

$$An_2\text{-}Bridge_2\text{-}Cat_1\text{-}Bridge_1\text{-}An_1,$$

wherein Cat_1-An_1 represents a charge transfer complex;

wherein Cat_1 and Cat_2 independently represent a radical having the structural formula



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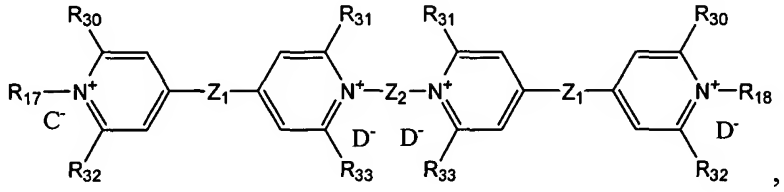
or having the structural formula



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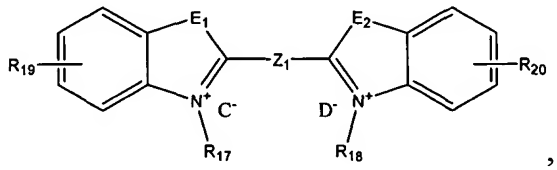
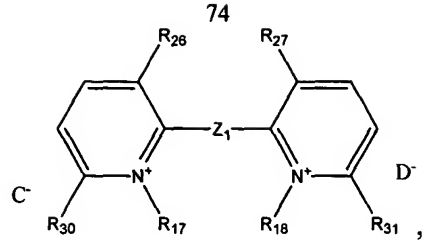
or having the structural formula

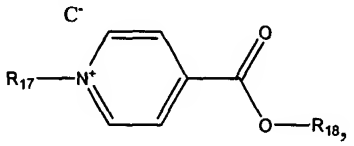


,

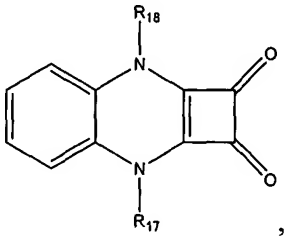
or having the structural formula



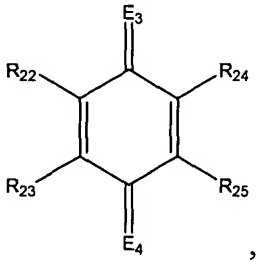
or having the structural formula



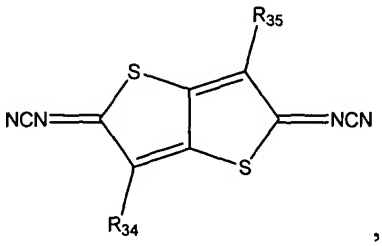
or having the structural formula



or having the structural formula



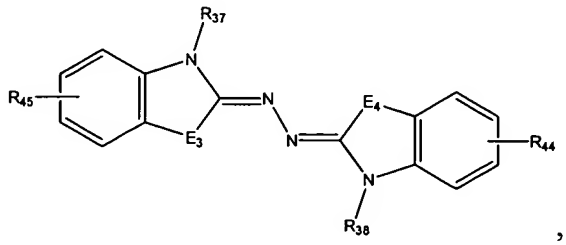
or having the structural formula



wherein R_{17} and R_{18} independently of one another denote C_1 to C_{18} -alkyl, C_2 to C_{12} -alkenyl, C_3 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} -aryl or R_{17} and R_{18} together form a $-(CH_2)_2-$, $-(CH_2)_3-$, or –CH=CH- bridge, R_{19}, R_{20} and R_{22} to R_{25} independently of one another denote hydrogen, C_1 to C_{18} -alkyl, C_1 to C_4 -alkoxy, halogen, cyano, nitro or

C_1 to C_{18} -alkoxycarbonyl or R_{22} and R_{23} and/or R_{24} and R_{25} form a –CH=CH-CH=CH- bridge; R_{26}, R_{27}, R_{28} and R_{29} independently of one another denote hydrogen or, in pairs, a -$(CH_2)_2$-, -$(CH_2)_3$- or –CH=CH- bridge, E_3 and E_4 independently of one another denote O, N-CN, $C(CN)_2$ or N-C_6 - to C_{10}-aryl, R_{34} and R_{35} independently denote hydrogen, C_1 to C_{18} -alkyl, C_1 to C_{18} -alkoxy, halogen, cyano, nitro, C_1 to C_{18} -alkoxycarbonyl or C_6 to C_{10} -aryl, R_{30} to R_{33} independently of one another denote hydrogen or C_1 to C_6 -alkyl, or R_{30} and R_{26} and/or R_{31} and R_{27} form a –CH=CH-CH=CH- bridge, E_1 and E_2 independently of one another denote O, S, NR_{36} or $C(R_{36})_2$ or E_1 and E_2 together form a -N-$(CH_2)_2$-N- bridge, R_{36} denotes C_1 to C_{18} -alkyl, C_2 to C_{12} -alkenyl, C_4 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} -aryl, Z_1 denotes a direct bond, -CH=CH-, -$C(CH_3)$=CH-, -C(CN)=CH-, -CCl=CCl-, -C(OH)=CH-, -CCl=CH-, -C≡C-, -CH=N-N=CH-, -$C(CH_3)$=N-N=$C(CH_3)$- or –CCl=N-N=CCl-, Z_2 denotes -$(CH_2)_r$- or –CH_2-C_6H_4-CH_2-, r=1-10, C^- is selected from the group consisting of bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$), and D^- is selected from the group consisting of halogen anion, ClO_4^-, BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, CH_3COO^-, and $CH_3(C_6H_4)SO_3^-$, trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$), wherein bonding to the bridge member $bridge_1$ or $bridge_2$ is effected via one of the radicals R_{17}-R_{36}, and the radicals mentioned then represent a direct bond,

and wherein An_1 and An_2 independently represent radicals having the structural formula:



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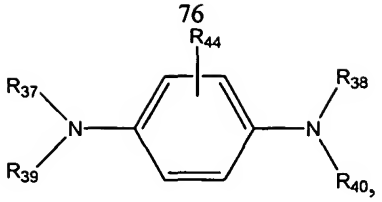
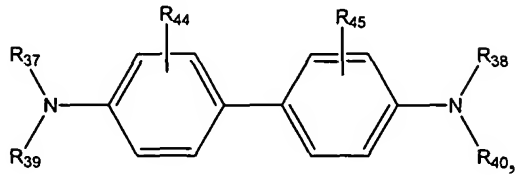
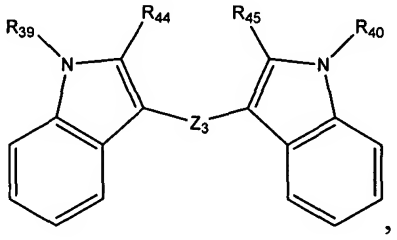
or having the structural formula



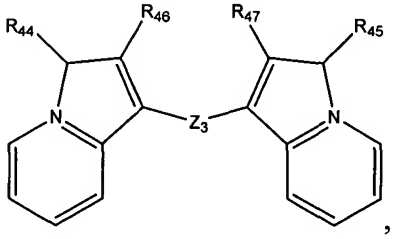
or having the structural formula



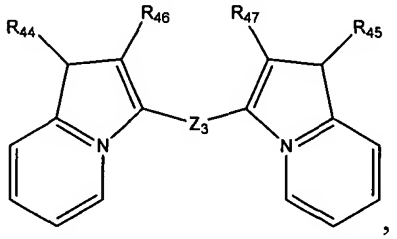
or having the structural formula



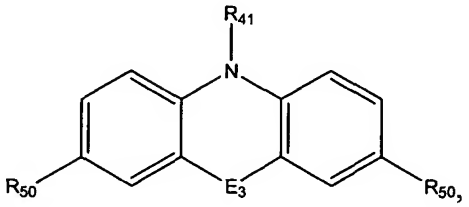
or having the structural formula



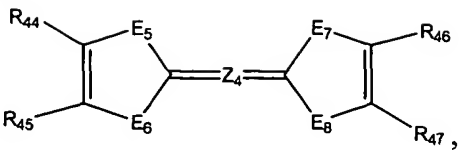
or having the structural formula



or having the structural formula



or having the structural formula



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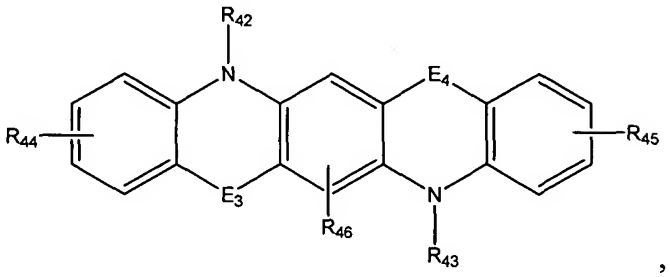
or having the structural formula



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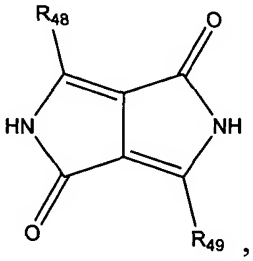
or having the structural formula



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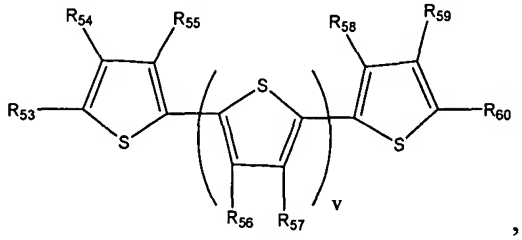
or having the structural formula



,

or wherein An_1 or An_2 independently represent a metal salt comprising titanium (III), vanadium (III), vanadium (IV), iron (II), cobalt (II), copper (I), silver (I), indium (I), tin (II), antimony (III), bismuth (III), cerium (III), samarium (II), dysprosium (II), ytterbium (II), or europium (II), wherein R_{37} to R_{43} independently of one another denote C_1 to C_{18} -alkyl, C_2 to C_{12} -alkenyl, C_3 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} -aryl, and R_{41} to R_{43} additionally denote hydrogen, R_{44} to R_{50} independently of one another denote hydrogen, C_1 to C_{18} -alkyl, C_1 to C_{18} -alkoxy, halogen, cyano, nitro, C_1 to C_{18} -alkoxycarbonyl or C_6 to C_{10} -aryl and R_{48} and R_{49} additionally denote an optionally benzo-

fused aromatic or quasiaromatic five- or six-membered heterocyclic ring and R_{50} additionally independently denotes $N(R_{51})(R_{52})$, R_{44} and R_{45} and/or R_{46} and R_{47} form a -$(CH_2)_3$-, -$(CH_2)_4$-, -$(CH_2)_5$- or –CH=CH-CH=CH- bridge, Z_3 denotes a direct bond or a –CH=CH- or –N=N- bridge, $=Z_4=$ denotes a direct double bond or a =CH-CH= or =N-N= bridge, E_3 and E_4 independently of one another denote O, S, NR_{51}, $C(R_{51})(R_{52})$, C=O or SO_2, E_5 to E_8 independently of one another denote S, Se or NR_{51}, R_{51} and R_{52} independently of one another denote C_1 to C_{12} -alkyl, C_2 to C_8 -alkenyl, C_3 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} –aryl, R_{53} to R_{60} independently of one another denote hydrogen, C_1 - to C_6 -alkyl, C_1 to C_{18} -alkoxy, cyano, C_1 to C_{18} -alkoxycarbonyl or C_6 to C_{10} -aryl, or R_{53} and R_{54} and R_{59} and R_{60} independently of one another together form a -$(CH_2)_3$-, -$(CH_2)_4$- or –CH=CH-CH=CH- bridge, v=0-10, wherein bonding to the bridge member $Bridge_1$ or $Bridge_2$ is effected by one of the radicals R_{37} –R_{54}, or R_{60} and the radicals mentioned then represent a direct bond, and $Bridge_1$ or $Bridge_2$ independently represents a bridge member of the formula -$(CH_2)_n$- or -$(Y_1)_s(CH_2)_m$-$(Y_2)_o$-$(CH_2)_p$-$(Y_3)_q$-, each of which is optionally substituted by C_1 to C_{18} -alkoxy, halogen or phenyl, Y_1 to Y_3 independently of one another independently represent O, S, NR_{61}, COO, CONH, NHCONH, cyclopentanediyl, cyclohexanediyl, phenylene or naphthylene, beta-dicarbonyls, R_{61} denotes C_1 to C_6 -alkyl, C_2 to C_6 -alkenyl, C_4 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 - to C_{10} -aryl, n=0-12, m=0-8, p=0-12, o=0-6, q=0-1, and s=0-1.

18. The electrolyte solution of claim 13, wherein said bifunctional redox dye comprises a redox active moiety comprising a pyrazoline, metallocene, phenylenediamine, benzidine, phenoxadine, phenothiazine, tetrafulvalene, phenazine, viologen or anthraquinone, and an energy receptor moiety comprising a benzophenone, benzotraizole, or cyanoacrylate.

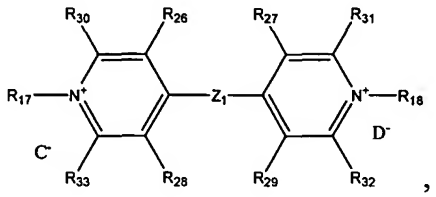
19. The electrolyte solution claim 11, further comprising at least one additive selected from the group consisting of non-ionic cosolvents, polymers, thixotropic agents, and UV stabilizers.

20. The electrolyte solution of claim 11, wherein said bifunctional redox dye comprises a compound having the formula

$$[Cat_1][M]$$

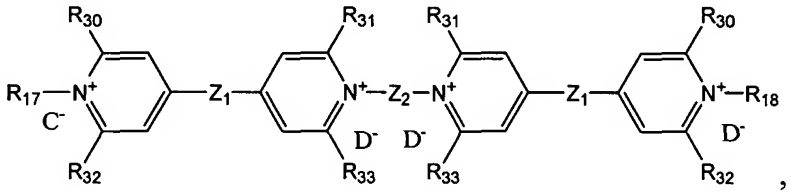
wherein M represents a metal salt comprising titanium (III), vanadium (III), vanadium (IV), iron (II), cobalt (II), copper (I), silver (I), indium (I), tin (II), antimony (III), bismuth (III), cerium (III), samarium (II), dysprosium (II), ytterbium (II), or europium (II);

wherein Cat_1 represents a ligand having the structural formula



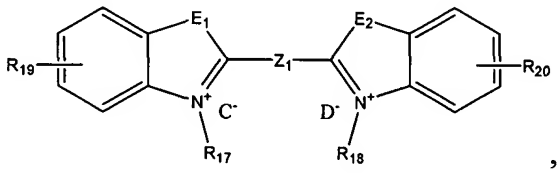
,

or having the structural formula



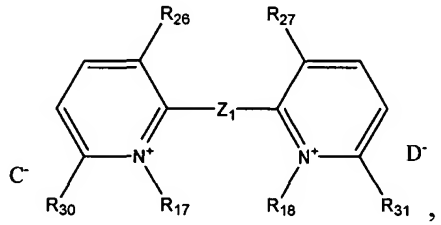
,

or having the structural formula



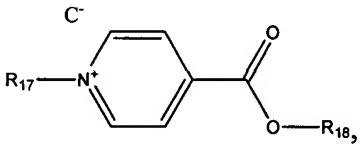
,

or having the structural formula



,

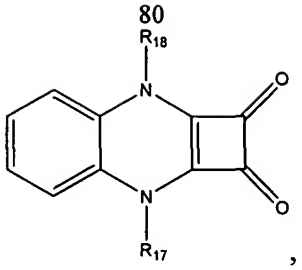
or having the structural formula



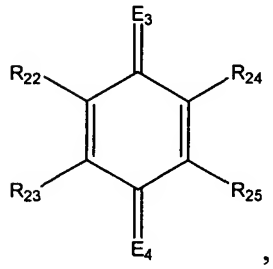
,

or having the structural formula

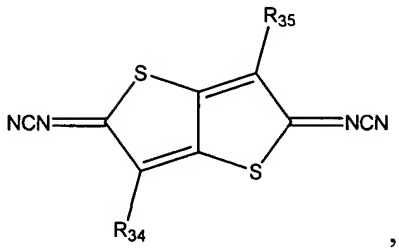
80



or having the structural formula



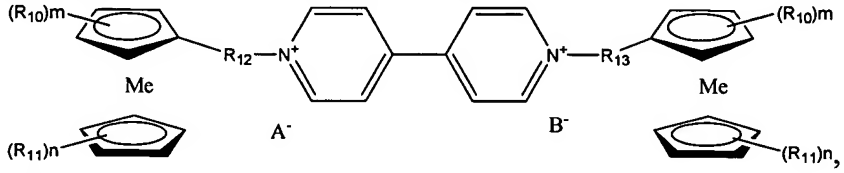
or having the structural formula



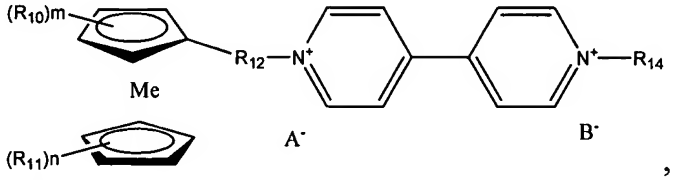
wherein R_{17} and R_{18} independently of one another denote C_1 to C_{18} -alkyl, C_2 to C_{12} -alkenyl, C_3 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} -aryl or R_{17} and R_{18} together form a $-(CH_2)_2-$, $-(CH_2)_3-$, or –CH=CH-, R_{19}, R_{20} and R_{22} to R_{25} independently of one another denote hydrogen, C_1 to C_{18} -alkyl, C_1 to C_{18} -alkoxy, halogen, cyano, nitro or C_1 to C_{18} -alkoxycarbonyl or R_{22} and R_{23} and/or R_{24} and R_{25} form a –CH=CH-CH=CH- bridge; R_{26}, R_{27}, R_{28} and R_{29} independently of one another denote hydrogen or, in pairs, a $-(CH_2)_2-$, $-(CH_2)_3-$ or –CH=CH- bridge, E_3 and E_4 independently of one another denote O, N-CN, $C(CN)_2$ or N-C_6 - to C_{10}-aryl, R_{34} and R_{35} independently denote hydrogen, C_1 to C_{18} -alkyl, C_1 to C_{18} -alkoxy, halogen, cyano, nitro, C_1 to C_{18} -alkoxycarbonyl or C_6 to C_{10} -aryl, R_{30} to R_{33} independently of one another denote hydrogen or C_1 –C_6 -alkyl, or R_{30} and R_{26} and/or R_{31} and R_{27} form a –CH=CH-CH=CH- bridge, E_1 and E_2 independently of one another denote O, S, NR_{36} or $C(R_{36})_2$ or E_1 and E_2 together form a $-N-(CH_2)_2-N-$ bridge, R_{36} denotes C_1 to C_{18} -alkyl, C_2 to C_{12} -alkenyl, C_4 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} -aryl, Z_1 denotes a direct bond, -CH=CH-, $-C(CH_3)=CH-$,

-C(CN)=CH-, -CCl=CCl-, -C(OH)=CH-, -CCl=CH-, -C≡C-, -CH=N-N=CH-, -C(CH_3)=N-N=C(CH_3)- or –CCl=N-N=CCl-, Z_2 denotes -(CH_2)$_r$- or –CH_2-C_6H_4-CH_2-, r=1-10, C^- is selected from the group consisting of bis(trifluoromethylsulfonyl)imide ((CF_3SO_2)$_2N^-$), bis(perfluoroethylsulfonyl)imide (($CF_3CF_2SO_2$)$_2N^-$) and tris(trifluoromethylsulfonyl)methide ((CF_3SO_2)$_3C^-$), and D^- is selected from the group consisting of halogen anion, ClO_4^-, BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, CH_3COO^-, and $CH_3(C_6H_4)SO_3^-$, trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ((CF_3SO_2)$_2N^-$), bis(perfluoroethylsulfonyl)imide (($CF_3CF_2SO_2$)$_2N^-$) and tris(trifluoromethylsulfonyl)methide ((CF_3SO_2)$_3C^-$).

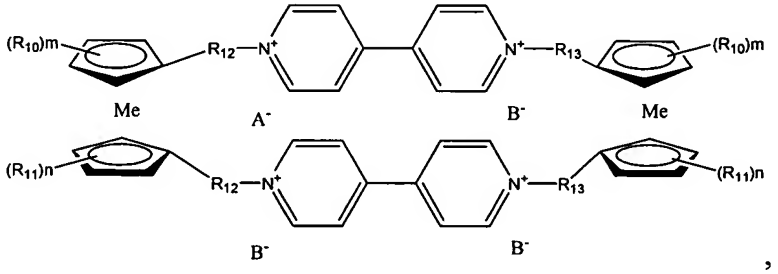
21. A compound having the structural formula



or having the structural formula

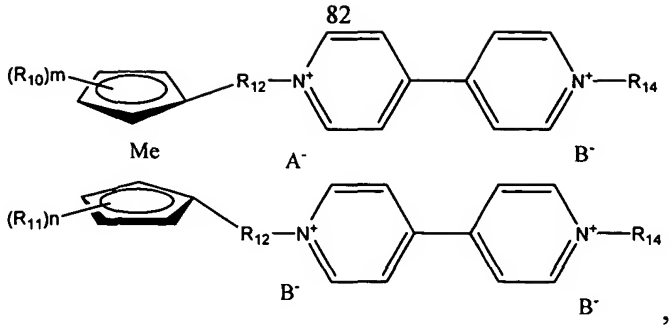


or having the structural formula



or having the structural formula

82



,

wherein A^- is selected from the group consisting of trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$); B^- is selected from the group consisting of a halogen anion, ClO_4^-, BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, CH_3COO^-, and $CH_3(C_6H_4)SO_3^-$, trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$); wherein R_{10} and R_{11} are each independently a hydrocarbon group selected from the group consisting of an alkyl, alkenyl and aryl group having 1 to 10 carbon atoms, in the case where R_{10} or R_{11} is an aryl group, the aryl group forms a condensed ring together with a cyclopentadienyl ring; wherein m=0-4; wherein n=0-4; wherein R_{12} and R_{13} are each independently a hydrocarbon residue having 1 to 20 carbon atoms, or alkylene groups having ester-bond unit, ether-bond unit, amide-bond unit, thioether-bond unit, amine-bond unit, urethane-bond unit, or silyl unit in the part of hydrocarbon groups, and R_{14} is a hydrocarbon group selected from the group consisting of an alkyl, cycloalkyl, alkenyl, aryl, or aralkyl group having 1 to 20 carbon atoms, a heterocyclic group having 4 to 20 carbon atoms, and a substituted hydrocarbon or heterocyclic group obtained by substituting part of hydrogens of the hydrocarbon group or heterocyclic group with a substituent group; and Me represents Cr, Co, Fe, Mn, Ni, Os, Ru, V, Mo(X)(Q), Nb(X)(Q), Ti(X)(Q), V(X)(Q)or Zr(X)(Q) wherein X and Q are each independently selected from the group consisting of hydrogen, halogen, an alkyl group having 1 to 12 carbon atoms, ClO_4^-, BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, CH_3COO^-, $CH_3(C_6H_4)SO_3^-$, trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$);

or having the formula

$$Cat_1\text{-}An_1,$$

or having the formula

$$Cat_1\text{-}Bridge_1\text{-}An_1,$$

or having the formula

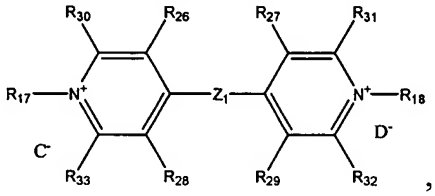
$$Cat_1\text{-}Bridge_1\text{-}An_1\text{-}Bridge_2\text{-}Cat_2,$$

or having the formula

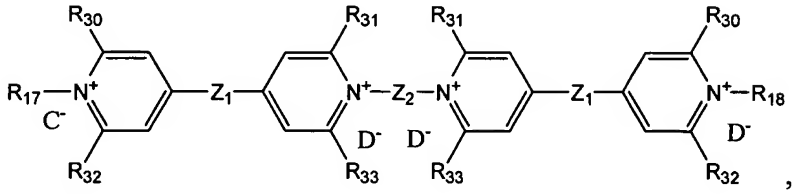
$$An_2\text{-}Bridge_2\text{-}Cat_1\text{-}Bridge_1\text{-}An_1,$$

wherein Cat_1-An_1 represents a charge transfer complex;

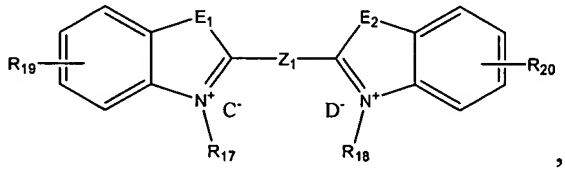
wherein Cat_1 and Cat_2 independently represent a radical having the structural formula



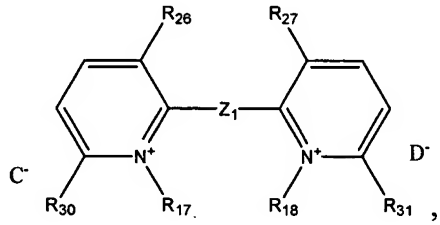
or having the structural formula



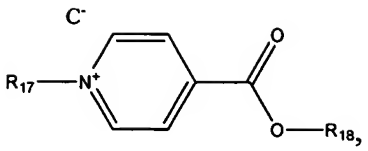
or having the structural formula



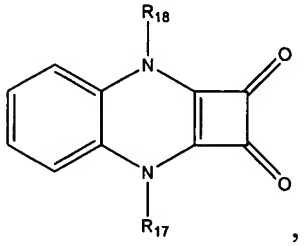
or having the structural formula



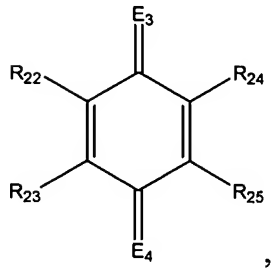
or having the structural formula



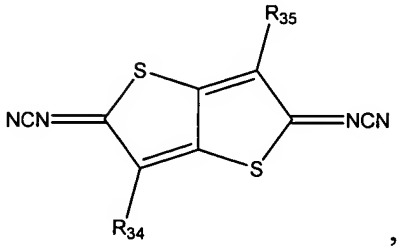
or having the structural formula



or having the structural formula



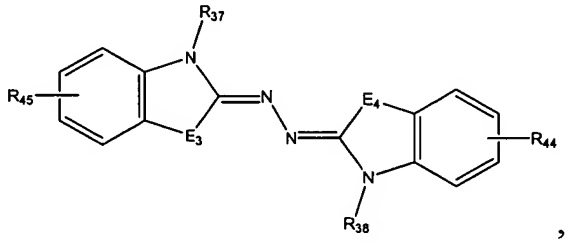
or having the structural formula



wherein R_{17} and R_{18} independently of one another denote C_1 to C_{18} -alkyl, C_2 to C_{12} -alkenyl, C_3 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} -aryl or R_{17} and R_{18} together form a $-(CH_2)_2-$, $-(CH_2)_3-$, or –CH=CH- bridge, R_{19}, R_{20} and R_{22} to R_{25} independently of one another denote hydrogen, C_1 to C_{18} -alkyl, C_1 to C_4 -alkoxy, halogen, cyano, nitro or C_1 to C_{18} -alkoxycarbonyl or R_{22} and R_{23} and/or R_{24} and R_{25} form a –CH=CH-CH=CH- bridge; R_{26}, R_{27}, R_{28} and R_{29} independently of one another denote hydrogen or, in pairs, a $-(CH_2)_2-$, $-(CH_2)_3-$ or –CH=CH- bridge, E_3 and E_4 independently of one another denote O, N-CN, $C(CN)_2$ or N-C_6 - to C_{10}-aryl, R_{34} and R_{35} independently denote hydrogen, C_1 to C_{18} -alkyl, C_1 to C_{18} -alkoxy, halogen, cyano, nitro, C_1 to C_{18} -alkoxycarbonyl or C_6 to C_{10} -aryl, R_{30} to R_{33} independently of one another denote hydrogen or C_1 to C_6 -alkyl, or R_{30}

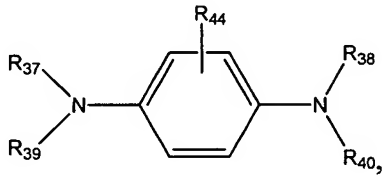
and R_{26} and/or R_{31} and R_{27} form a –CH=CH-CH=CH- bridge, E_1 and E_2 independently of one another denote O, S, NR_{36} or $C(R_{36})_2$ or E_1 and E_2 together form a -N-$(CH_2)_2$-N- bridge, R_{36} denotes C_1 to C_{18} -alkyl, C_2 to C_{12} -alkenyl, C_4 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} -aryl, Z_1 denotes a direct bond, -CH=CH-, -$C(CH_3)$=CH-, -C(CN)=CH-, -CCl=CCl-, -C(OH)=CH-, -CCl=CH-, -C≡C-, -CH=N-N=CH-, -$C(CH_3)$=N-N=$C(CH_3)$- or –CCl=N-N=CCl-, Z_2 denotes -$(CH_2)_r$- or –CH_2-C_6H_4-CH_2-, r=1-10, C^- is selected from the group consisting of bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$), and D^- is selected from the group consisting of halogen anion, ClO_4^-, BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, CH_3COO^-, and $CH_3(C_6H_4)SO_3^-$, trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$), wherein bonding to the bridge member $bridge_1$ or $bridge_2$ is effected via one of the radicals R_{17}-R_{36}, and the radicals mentioned then represent a direct bond,

and wherein An_1 and An_2 independently represent radicals having the structural formula:

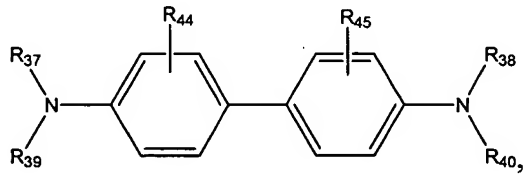


,

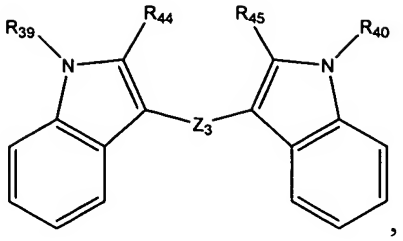
or having the structural formula



or having the structural formula

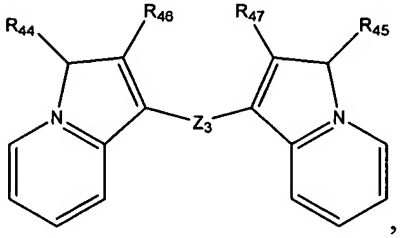


or having the structural formula



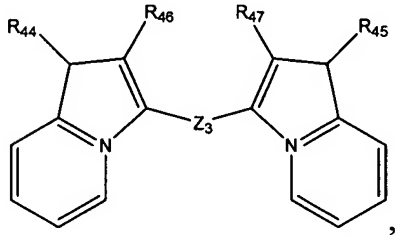
,

or having the structural formula



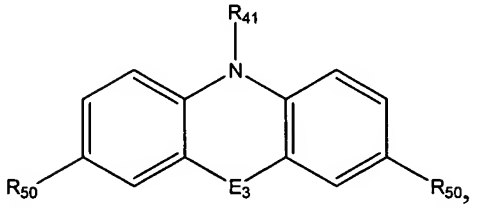
,

or having the structural formula



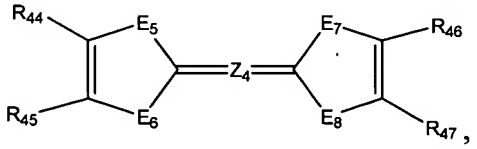
,

or having the structural formula



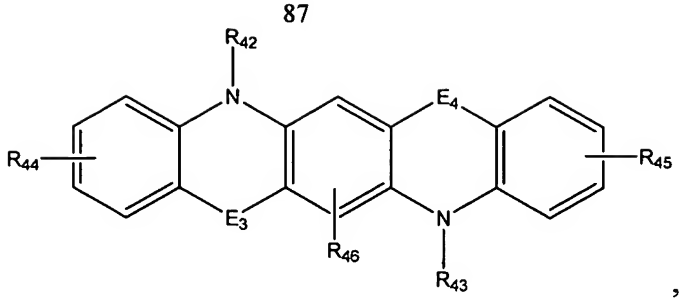
,

or having the structural formula

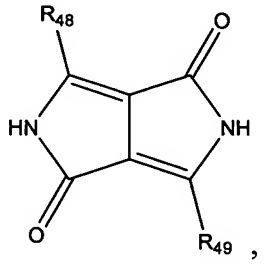


,

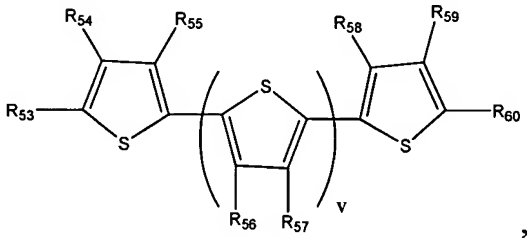
or having the structural formula



or having the structural formula



or having the structural formula



or wherein An_1 or An_2 independently represent a metal salt comprising titanium (III), vanadium (III), vanadium (IV), iron (II), cobalt (II), copper (I), silver (I), indium (I), tin (II), antimony (III), bismuth (III), cerium (III), samarium (II), dysprosium (II), ytterbium (II), or europium (II), wherein R_{37} to R_{43} independently of one another denote C_1 to C_{18} -alkyl, C_2 to C_{12} -alkenyl, C_3 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} -aryl, and R_{41} to R_{43} additionally denote hydrogen, R_{44} to R_{50} independently of one another denote hydrogen, C_1 to C_{18} -alkyl, C_1 to C_{18} -alkoxy, halogen, cyano, nitro, C_1 to C_{18} -alkoxycarbonyl or C_6 to C_{10} -aryl and R_{48} and R_{49} additionally denote an optionally benzo-fused aromatic or quasiaromatic five- or six-membered heterocyclic ring and R_{50} additionally independently denotes $N(R_{51})(R_{52})$, R_{44} and R_{45} and/or R_{46} and R_{47} form a -$(CH_2)_3$-, -$(CH_2)_4$-, -$(CH_2)_5$- or –CH=CH-CH=CH- bridge, Z_3 denotes a direct bond or a –CH=CH- or –N=N- bridge, =Z_4= denotes a direct double bond or a =CH-CH= or =N-N= bridge, E_3 and E_4 independently of one another denote O, S, NR_{51}, $C(R_{51})(R_{52})$, C=O or

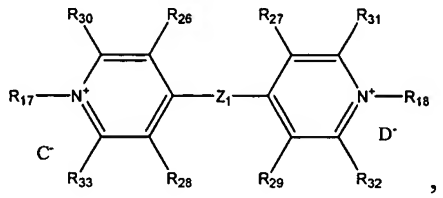
SO_2, E_5 to E_8 independently of one another denote S, Se or NR_{51}, R_{51} and R_{52} independently of one another denote C_1 to C_{12} -alkyl, C_2 to C_8 -alkenyl, C_3 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} –aryl, R_{53} to R_{60} independently of one another denote hydrogen, C_1 - to C_6 -alkyl, C_1 to C_{18} -alkoxy, cyano, C_1 to C_{18} -alkoxycarbonyl or C_6 to C_{10} -aryl, or R_{53} and R_{54} and R_{59} and R_{60} independently of one another together form a $-(CH_2)_3-$, $-(CH_2)_4-$ or –CH=CH-CH=CH- bridge, v=0-10, wherein bonding to the bridge member $Bridge_1$ or $Bridge_2$ is effected by one of the radicals R_{37} –R_{54}, or R_{60} and the radicals mentioned then represent a direct bond, and $Bridge_1$ or $Bridge_2$ independently represents a bridge member of the formula $-(CH_2)_n-$ or $-(Y_1)_s(CH_2)_m-(Y_2)_o-(CH_2)_p-(Y_3)_q-$, each of which is optionally substituted by C_1 to C_{18} -alkoxy, halogen or phenyl, Y_1 to Y_3 independently of one another independently represent O, S, NR_{61}, COO, CONH, NHCONH, cyclopentanediyl, cyclohexanediyl, phenylene or naphthylene, beta-dicarbonyls, R_{61} denotes C_1 to C_6 -alkyl, C_2 to C_6 -alkenyl, C_4 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 - to C_{10} -aryl, n=0-12, m=0-8, p=0-12, o=0-6, q=0-1, and s=0-1.

22. A compound having the structure the formula, wherein said bifunctional redox dye comprises a compound having the formula

$$[Cat_1][M]$$

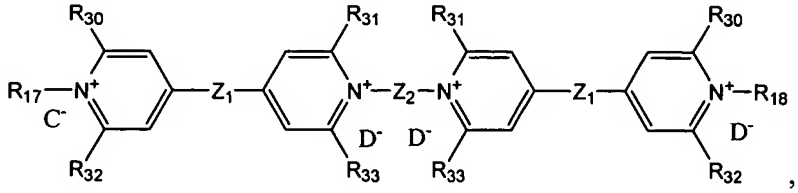
wherein M represents a metal salt comprising titanium (III), vanadium (III), vanadium (IV), iron (II), cobalt (II), copper (I), silver (I), indium (I), tin (II), antimony (III), bismuth (III), cerium (III), samarium (II), dysprosium (II), ytterbium (II), or europium (II);

wherein Cat_1 represents a ligand having the structural formula



,

or having the structural formula



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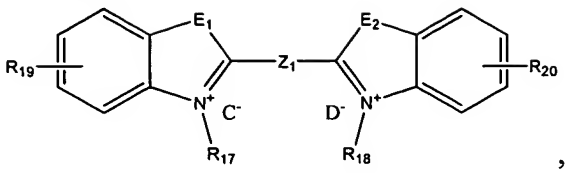
or having the structural formula



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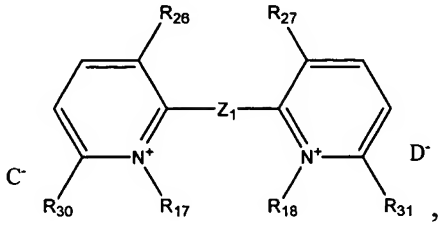
or having the structural formula



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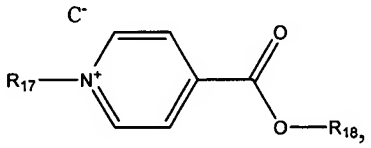
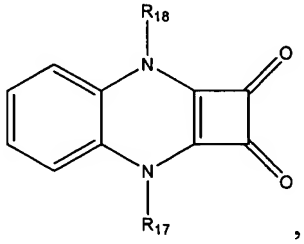
or having the structural formula



or having the structural formula



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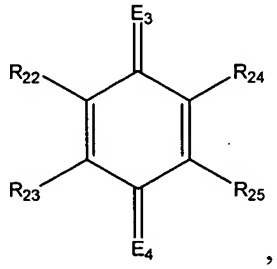
or having the structural formula



,

or having the structural formula

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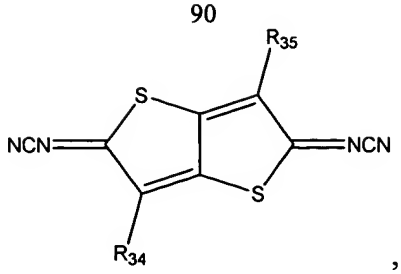

,

wherein R_{17} and R_{18} independently of one another denote C_1 to C_{18} -alkyl, C_2 to C_{12} -alkenyl, C_3 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} -aryl or R_{17} and R_{18} together form a $-(CH_2)_2-$, $-(CH_2)_3-$, or –CH=CH-, R_{19}, R_{20} and R_{22} to R_{25} independently of one another denote hydrogen, C_1 to C_{18} -alkyl, C_1 to C_{18} -alkoxy, halogen, cyano, nitro or C_1 to C_{18} -alkoxycarbonyl or R_{22} and R_{23} and/or R_{24} and R_{25} form a –CH=CH-CH=CH- bridge; R_{26}, R_{27}, R_{28} and R_{29} independently of one another denote hydrogen or, in pairs, a $-(CH_2)_2-$, $-(CH_2)_3-$ or –CH=CH- bridge, E_3 and E_4 independently of one another denote O, N-CN, $C(CN)_2$ or N-C_6 - to C_{10}-aryl, R_{34} and R_{35} independently denote hydrogen, C_1 to C_{18} -alkyl, C_1 to C_{18} -alkoxy, halogen, cyano, nitro, C_1 to C_{18} -alkoxycarbonyl or C_6 to C_{10} -aryl, R_{30} to R_{33} independently of one another denote hydrogen or C_1 –C_6 -alkyl, or R_{30} and R_{26} and/or R_{31} and R_{27} form a –CH=CH-CH=CH- bridge, E_1 and E_2 independently of one another denote O, S, NR_{36} or $C(R_{36})_2$ or E_1 and E_2 together form a $-N-(CH_2)_2-N-$ bridge, R_{36} denotes C_1 to C_{18} -alkyl, C_2 to C_{12} -alkenyl, C_4 to C_7 -cycloalkyl, C_7 to C_{15} -aralkyl or C_6 to C_{10} -aryl, Z_1 denotes a direct bond, -CH=CH-, $-C(CH_3)=CH-$, -C(CN)=CH-, -CCl=CCl-, -C(OH)=CH-, -CCl=CH-, -C≡C-, -CH=N-N=CH-, $-C(CH_3)=N-N=C(CH_3)-$ or –CCl=N-N=CCl-, Z_2 denotes $-(CH_2)_r-$ or $-CH_2-C_6H_4-CH_2-$, r=1-10, C^- is selected from the group consisting of bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$), and D^- is selected from the group consisting of halogen anion, ClO_4^-, BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, CH_3COO^-, and $CH_3(C_6H_4)SO_3^-$, trifluoromethylsulfonate ($CF_3SO_3^-$), bis(trifluoromethylsulfonyl)imide ($(CF_3SO_2)_2N^-$), bis(perfluoroethylsulfonyl)imide ($(CF_3CF_2SO_2)_2N^-$) and tris(trifluoromethylsulfonyl)methide ($(CF_3SO_2)_3C^-$).

23. A method for filling an empty electrooptic device with fluid comprising warm ionic liquid electrolyte solution, the device having relatively closely spaced plates, each

plate having an inwardly facing conductive surface, the plates being sealed around their periphery by a seal that encloses an area of each plate, comprising:

(a) introducing a small opening into the seal of an empty device;

(b) placing the empty device into a chamber along with a container of fluid comprising ionic liquid electrolyte solution;

(c) evacuating the chamber;

(d) lowering the empty device into the fluid such that the opening in the seal is located under the surface of the fluid;

(e) warming at least a portion of the fluid to a temperature of at least 40°C;

(f) exposing the fluid to a gas pressure greater than the pressure in the empty device to send the warm fluid into the device; and

(g) sealing the gap in the peripheral seal of the device.